

September 7, 1959

TO : Ramo-Wooldridge Corporation
INFO : Headquarters
25X1A FROM : [REDACTED]
SUBJECT : System Four Field Report, August 1959

I. Activities of System Four Personnel

During this month the second in a series of System Four test flights was flown in effort to quantitatively evaluate any improvement in performance resulting from certain noise suppression measures recently employed. In order to provide the most accurate comparison of data with that which may be taken at other locations and under different conditions it is important to record here certain particulars regarding these tests.

Both test flights were carried out in aircraft 344, the only vehicle at this location equipped with suitable electrical filters for reducing noise originating in the inverter and autopilot. For more detailed information on this modification reference Lockheed Aircraft Service Bulletin Number 398. System Four, Serial Number 103, was used on both flights. It should be noted that this model has mounted on its frame a 28 volt DC aircraft blower fan which is energized at the time of system "turn-on" and is used for cooling.

Receivers 1A, 1B, and 2, in which the objectionable noise has caused repeated lock-ons during previous flights, were adjusted in the laboratory as follows: The gain potentiometer on receiver 1A and receiver 1B was adjusted such that the maximum DC noise level at the detector was -0.2 volts. This was done with the receivers mounted in the rack, energized by the system power supply, and the input fed by the appropriate distributed amplifier. Similarly, receiver 2 was set at -0.3 volts with its preamplifier connected. Each of the three receivers gave a threshold indication at a detector output voltage of -0.7 volts, in which case the receiver stopped slewing for a preset time of 10 seconds.

As mentioned in the July Field Report, no tracker camera was carried on the first mission. A close examination of the magnetic tape following the flight showed a tremendous improvement in performance

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of bands 1A and 1B. No evidence could be found of noise in the 145 to 300 megacycles per second region and both receivers slewed without interruption except for legitimate signal intercepts, of which there were several including both voice and pulse type transmission. Unfortunately there was no significant improvement in band 2, as the number and intensity of noise lock-ons was considerable.

During the second test flight, which took place on August 12, a modified tracker camera was carried along to determine what degradation in the performance of bands 1A and 1B would occur compared with the first mission. This modified tracker incorporated several line filters which were intended to isolate the 28 volt DC primary power from the two DC motors used in the tracker itself. The results were generally disappointing as receivers 1A, 1B, and 2 were again continually locked-up on noise; this seriously compromises almost 40% of the superheterodyne receiving capability.

Based on the results of these two test flights the following suggestions are offered for consideration: First of all, a special noise search of the vehicle should be made in the 300 to 600 megacycles per second band and appropriate measures taken to reduce or eliminate the interference. Secondly, if it is considered absolutely necessary to have a tracker camera accompany System Four missions, the tracker must be redesigned using AC motors. Otherwise, for optimum performance, System Four Operation Orders should specify that no tracker camera be used.

II. Future Activities of System Four Personnel

During the recent period all System Four subassemblies were completely bench checked and made ready for preflight. At this time all units are operational and none are awaiting parts or major repair. In the near future it is planned to check the compatibility of System Four and the newly arrived [redacted] vehicles on a test flight.

Two field modification kits, as described in Field Service Bulletin Number 4-18 have arrived; the serial number 103 power supply has already been modified to provide regulation to the 55 volt DC bus. The 8C-1, 8C-2, and 8C-3 boards are now being changed to return the CW capability to the crystal video receivers. Following a thorough checkout of this modification on serial number 103, model 102 will similarly be changed to give full pulse and CW capability in the 10 to 40 kilo-megacycles per second band.

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Approved:

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Chief of Communications

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Respectfully submitted,

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System Four Field Engineer

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ELINT SYSTEMS REPORT FOR AUGUST 19591. Headquarters Directed Missions:

a: August	Mission No.	Aircraft	Time Aloft	Systems
30	6051 Ferry	355	6:30	VI and III *
30	6085	359	6:25	I-B-S and IIIA
31	6035 Ferry	359	7:15	I-B-S and IIIA **

* Ferry flight - Systems not used.

** Systems installed in aircraft used although not directed.

b: Malfunctions:

Mission 6085: System I-B-S power supply, #1-11713, Serial 115, fuse blew when AC switch was turned on.

System IIIA receiver B failed 2 hours and 15 minutes after being activated. Receiver A failed 2 hours and 50 minutes after being activated.

Mission 6035 Ferry: System I-B-S inoperative due to power supply failure.

System IIIA receiver B failed 1 hour and 40 minutes after takeoff. Receiver A failed 4 hours and 25 minutes after takeoff.

2. Test flights of Elint Systems:

a: August	Mission No.	Aircraft	Time Aloft	Systems
4	GT-59-45	355	3:05	VI *

* Article 355 was utilized for a weather flight and then modified for System VI. This test flight was to insure correctness of modification.

b: Malfunctions:

None.

3. Elint activity:

The entire month was spent on preparation for staging, staging activities, return and re-staging.

4. Field service:

Work is in progress for modifying Systems Information recorders, #1-13737, according to Field Service Bulletin No. 1-11. 4 kits have been received.

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